

1. A system for controlling temperature comprising:

a temperature sensor operable to sense a temperature at a certain location of said

system;

a first flow valve operable to selectively increase or decrease refrigerant flow in a first

5 flow path;

a second flow valve operable to selectively increase or decrease hot gas flow in a second flow path; and

a controller that controls the first and second flow valves in response to the temperature sensed by the temperature sensor.

10 2. The temperature control device according to claim 1, wherein the controller

opens the first valve and closes the second valve when the sensed temperature is greater than

a predetermined value.

15 3. The temperature control device according to claim 1, wherein the controller

closes the first valve and opens the second valve when the sensed temperature is less than a

predetermined value.

4. The temperature control device according to claim 1, wherein said first flow

path comprises a compressor, a condenser and an evaporator.

15 5. The temperature control device according to claim 4, wherein said second flow

path comprises said compressor and said evaporator.

6. The temperature control device according to claim 1, wherein said second flow path comprises a compressor and an evaporator.

7. The temperature control device according to claim 6, further comprising a capillary tube connected to said compressor wherein refrigerant from the compressor is
5 cooled.

8. The temperature control device according to claim 1, wherein the controller is a primary thermostat.

9. The temperature control device according to claim 1, further comprising a secondary thermostat.

10 10. A system for controlling temperature, comprising:
means for sensing a temperature at a certain location of an incubation system;
means for increasing or decreasing refrigerant flow in a first flow path in response to
the temperature sensed by the sensing means;
means for increasing or decreasing hot gas flow in a second flow path in response to
15 the temperature sensed by the sensing means; and
means for controlling the valves in response to the temperature sensed by the
temperature sensing means.

20 11. A system according to claim 10, wherein the means for controlling the values opens a first flow valve and closes a the second flow valve when the sensed temperature is greater than a predetermined value.

12. A system according to claim 10, wherein said step of controlling the temperature further comprises:

regulating the air discharge temperature of said evaporator with a low pressure sensor by shutting down portions of the system; and

5 regulating the air discharge temperature of said evaporator with a high pressure sensor shutting down portions of the system.

13. A method of providing back-up temperature control, comprising the steps of: maintaining the temperature inside a chamber within a temperature range with a first controller;

10 sensing the temperature inside a chamber with a second temperature controller; cycling a compressor on and opening a first valve when the temperature inside the chamber is outside the temperature range of the first controller and reaches a maximum temperature set point of the second temperature controller;

15 measuring the time duration after the compressor cycles on and said first valve is opened;

shutting the first valve after a predetermined time has passed and opening a second valve; and

20 cycling the compressor off when the temperature in the chamber is outside the selected range of the first controller and reaches a minimum temperature set point of the second temperature controller.

14. The method of claim 13 wherein said second temperature controller is a mechanical thermostat.

15. The method of claim 14 wherein said first valve is a hot gas bypass solenoid valve.

16. The method of claim 15 wherein said second valve is a high pressure liquid solenoid valve.

5 17. The method of claim 13 wherein said maximum temperature set point of said second temperature controller is 37 °F.

18. The method of claim 13 wherein said minimum temperature set point of said second temperature controller is 33 °F.

19. The method of claim 18 wherein said maximum temperature set point of said 10 second temperature controller is 37 °F.

20. The method of claim 13, wherein said method is employed in an incubator.